We claim:

1. A method of extending the frequency range of a microphone array embedded in a diffracting object beyond a microphone spacing limitation of $\lambda/2$, where λ=acoustic wavelength, comprising:

configuring said diffracting object to obtain a desired high frequency directivity response at predetermined microphone positions on said diffracting object;

providing a low frequency beamformer operable at said predetermined microphone positions to achieve a desired low frequency directivity response; and

applying linear constraints to said beamformer for providing a smooth transition between said low and high frequency directivity responses.

2. The method of claim 2, comprising applying a thin layer of acoustic absorbent material to the surface of said diffracting object to absorb sound at high frequencies.

3. The method of claim 2, wherein said acoustic absorbent material is applied between respective ones of said microphones.

4. The method of claim 3, wherein said acoustic absorbent material is applied to a thickness of about $\lambda/4$ or higher to trap sound waves of wavelength λ.

5. A conferencing unit, comprising:

an array of microphones embedded in a diffracting object configured to provide a desired high frequency directivity response at predetermined microphone positions on said diffracting object; and

a low frequency beamformer operable at said predetermined microphone positions to achieve a desired low frequency directivity response, wherein said beamformer is linearly constrained to provide a smooth transition between said low and high frequency directivity responses.

6. The conferencing unit of claim 5, further including a thin layer of acoustic absorbent material applied to the surface of said diffracting object to absorb sound at high frequencies.

7. The conferencing unit of claim 6, wherein said acoustic absorbent material is applied between respective ones of said microphones.

8. The conferencing unit of claim 7, wherein said acoustic absorbent material is applied to a thickness of about $\lambda/4$ or higher to trap sound waves of wavelength λ.

9. The conferencing unit of claim 6 wherein said acoustic absorbent material is one of either open cell foam or felt.

10. The conferencing unit of claim 5, wherein said beamformer is linearly constrained using two symmetrical look directions $d_{\theta-\alpha}$ and $d_{\theta+\alpha}$ with a gain constraint less than one where the spacing $\theta-\alpha$ and $\theta+\alpha$ is controlled by α which increases with frequency.

11. The conferencing unit of claim 10, wherein said gain constraint is approximately 0.707.

12. A method of extending the frequency range of a wave sensor array embedded in a diffracting object beyond a inter sensor spacing limitation of $\lambda/2$, where λ=acoustic wavelength, comprising:

configuring said diffracting object to obtain a desired high frequency directivity response at predetermined sensor positions on said diffracting object;

providing a low frequency beamformer operable at said predetermined sensor positions to achieve a desired low frequency directivity response; and

applying linear constraints to said beamformer for providing a smooth transition between said low and high frequency directivity responses.